Amendments to the Drawings:

Sheets 1 of 5 and 4 of 5 have been amended.

The amendment to Figure 1 on sheet 1 of 5 is the replacement of reference character 39 (D/A2) with new reference character 49. The same amendment has been made to Figure 5 on sheet 4 of 5.

Attachment: Replacement Sheets
Annotated Sheets Showing Changes

REMARKS/ARGUMENTS

Amendments to Specification

The specification has been amended by replacing the paragraph starting on p. 10, line 12 and replacing the paragraph starting on p.11, line 28.

In the paragraph starting on p. 10, line 12, the reference character for the digital-to-analog converter in Figure 1 has been changed from 39 to 49, as the compensation element in Figure 1 is also identified by reference character 39.

In the paragraph starting on p.11, line 28, the reference character for the controller on line 30, which was incorrectly identified as 90, has been replaced with correct reference character 40.

Amendments to Drawings

In amended Figure 1, reference character 39 used to formerly identify component D/A2 has been replaced with new reference character 49. This is for consistency with the amendment made to the specification discussed above. Figure 5 has been similarly amended.

Status of Claims

Claims 1-24 remain in the application.

35 U.S.C 103 Claim Rejections

Claims 1, 2, 14, 15, 16, 18, 20 and 21 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Frodigh et al (US 6,694,148) in view of Shu et al (US 7,062,289). For the reasons that follow it is respectfully submitted that the Examiner has not established a *prima facie* case of obviousness. In particular, it is submitted that all the claimed limitations are not taught by the combination of references cited by the Examiner.

Independent claim 1 recites "determining a current total transmit power for the output", determining a set of digital gains in response to the current total transmit power" and "the set of digital gains ... compensating for non-linearities in the transmitter as a function of the current

total transmit power such that a desired relationship between channel powers of said set of channels after having been combined to produce the output is achieved". Independent claim 21 recites the same three limitations and independent claim 15 recites the latter limitation. It is respectfully submitted that neither of the two references cited by the Examiner discloses these limitations.

The Examiner equates modulators MOD_1 and MOD_N of Frodigh et al (Figure 5A, and described in column 8, lines 23-63) as being used in "determining a current total transmit power for the output". However, in Frodigh et al at column 1, lines 38-42, MOD_1 and MOD_N are described as modulators "where the bits associated with each data signal are symbol encoded for transmission, i.e., the modulator generates the corresponding baseband waveform". There is no suggestion that the modulators are used in "determining a current total transmit power for the output".

The portions of Frodigh et al cited by the Examiner disclose calculating a desired P_{sum} and modifying power control commands for one or several users if the desired P_{sum} exceeds the maximum tolerable threshold level for the multi-carrier power amplifier (MCPA) in order to keep P_{sum} less than or equal to the threshold level (col. 8 lines 39 to 47). Thus, gains applied to each user are determined based on a comparison of the calculated desired transmit power with a threshold level rather than in response to the current total transmit power. Furthermore, as admitted by the Examiner Frodigh et al does not disclose the digital gains compensating for non-linearities in the transmitter as a function of the current total transmit power such that a desired relationship between channel powers is achieved. The goal of this reference is to provide a more efficient allocation of average output power or to serve a larger number of users (column 4, lines 23 to 42). In addition, compensating for non-linearities by adjusting gains as a function of total transmit power is not contemplated or suggested.

It is submitted that Shu et al do not disclose the claimed limitations missing from Frodigh et al. The Shu et al reference is directed to automatic power control in which "transmitting power of a transmitter will be adaptively decreased under a condition that excellent transmission quality can be obtained without the maximum transmitting power, namely, the transmitting

power of mobile stations or base stations will be reduced if it can be ensured that transmitting quality is greater than a given threshold (column 1, lines 35-41).

Multiple digital up-conversion processors 204, 205, 206 are disclosed by Shu et al for use in up-converting baseband signals 201, 202, 203. Power control data and carrier frequency information 214 are applied to the digital up-conversion processors 204, 205, 206 via data processor 215. Applicant submits that it is not well defined in the patent what exactly the power control data and carrier frequency information 214 is. At column 3, lines 52-56 Shu et al disclose "the data processor receiving power control data and information of respective carrier frequencies, and generating dynamic control data, static control data and corresponding up-down slope control data corresponding to the respective carrier frequencies".

The Examiner seems to be equating "the current total transmit power" recited in the claims of the present application with the power control data and carrier frequency information 214 applied to data processor 215. There is no suggestion or disclosure in Shu et al that the power control data and carrier frequency information 214 is the same as "current total transmit power". There does not seem to be any other function disclosed in Shu et al that the Examiner would be equating to the "current total transmit power".

Shu et al disclose at multiple locations in the patent, for example at column 2, lines 40-41 and column 9, lines 12-14, that "the transmitting power of any carrier at any time slot can be varied flexibly and easily". However, there is no mention in Shu et al of the baseband signals 201, 202, 203 having any type of "desired relationship" to be achieved based on their relative transmit powers as recited in the claim limitation. Shu et al is more concerned with being able to control the power of individual carriers than any type of overall relationship between the controlled carriers. Therefore, Applicant submits there is no disclosure of "a desired relationship between channel powers of said set of channels after having been combined to produce the output is achieved".

As Shu et al do not disclose "determining a current total transmit power for the output", "compensating for non-linearities in the transmitter as a function of the current total transmit power" and do not suggest or disclose a "desired relationship" to be achieved based on relative

transmit powers of multiple channels, Applicant submits that Shu et al do not disclose all the limitations of the independent claims.

A further difference between the subject matter of the present application and the subject matter of the references cited by the Examiner is a rather fundamental difference.

In the present application, the set of code channels being power controlled is transmitted on a single carrier. The channels each use a different code to mitigate interference between the respective channels, but all of the channels are transmitted on a single carrier. In the example of Figure 1 of the present application, a single mixer 32 is illustrated in the analog portion of the transmitter for up-converting the combined set of code channels output from the Pilot Generator 13, the FCH Encoder 14 and the SCH Encoder 15. Applicant also draws the Examiner's attention to the paragraph starting at page 8, lines 16-27, which describes a problem with a cause that was previously not considered pertaining to multiple code channels and for which the present application is directed to addressing. As the cause of the problem was previously not considered, Applicant submits that this is not the same problem that the cited prior art is addressing, and therefore, the solution proposed by the present application is not the same as what is disclosed by the cited references.

The two references cited in the obviousness rejection are each directed to power control of signals to be transmitted on multiple carriers in a transmitter. That is, powers of signals to be transmitted on different respective carriers by the transmitter are controlled independently. As can be seen in Figure 5A of Frodigh et al, each baseband signal (for example BB_N) is modulated and by a modulator (MOD_N), power controlled by a digital power control module (DCP_N) and then up-converted on a given carrier frequency by a mixer ($MULTI_N$). Similarly, as can be seen in Figure 2 of Shu et al, each baseband signal, for example CH-N, is modulated and up-converted by a digital up-conversion processor, for example DUC 206. The digital up-conversion processor 206 up-converts the baseband signal to a given carrier frequency, the given carrier frequency determined in part by "carrier frequency information" provided to the digital up-conversion processor by the data processor 215. Applicant submits that both references refer to "multi-carrier" in their respective titles and also specifically recite "multi-carrier" in their

independent claims. There is no suggestion or disclosure in either reference of controlling the power of individual channels, which is what is recited in the claims of the present application.

As there is no suggestion or disclosure in either reference of "setting relative powers of the set of code channels" as recited in the claims, Applicant submits that this is another reason why the combination of references does not disclose all the limitations of the claims.

Furthermore, with regard to claim 15, the claim recites "a plurality of code channel generators and/or code channel encoders; for each code channel generator and/or code channel encoder, a respective digital gain element". The Examiner has not indicated where in Frodigh et al and/or Shu et al these features are disclosed. Frodigh et al includes a reference to use of the disclosed invention within a CDMA system at column 11, lines 8-11. Specifically:

> For example, while the invention has been described in the context of a TDMA system, it is understood that the invention is usable in code division multiple access (CDMA) and frequency division multiple access (FDMA) systems as well.

The description of the embodiments does not teach adjusting power of TDMA components; rather TDMA is the example of how channel division can be achieved. The power adjustment is still performed between carriers. As such, this passage is simply saying that, in a multi-carrier system in which CDMA is used, the power of the carriers can be adjusted in a similar manner to that described for the TDMA embodiment. This passage does not suggest that the power of individual code channels would be adjusted.

Claims 2 and 14 are dependent on claim 1 and are thus distinguishable over Frodigh et al and Shu et al for at least the reasons given above.

Claims 16, 18 and 20 are dependent on claim 15 and are thus distinguishable over the two cited references for at least the reasons given above. With respect to col. 9 lines 41 to 64 of Frodigh et al, P_{kout} is not the total transmit power of the transmitter. Rather it is the absolute power level of a particular carrier signal. Therefore, this paragraph does not disclose all of the additional features of claim 16.

Furthermore, it is submitted that there is no suggestion or motivation in either of the cited references to combine. As mentioned above, the goal of Frodigh et al is to provide more efficient allocation of average output power. Gains are determined using a calculated desired total transmit power. Whereas, Shu et al. is directed to power control of a plurality of carriers on an individual basis that enables transmission power to be reduced if it can be ensured that transmitting quality is greater than a given threshold. Reducing the power may decrease multiple access interference, which may also have the effect of improving channel quality and increasing system capacity (column 1, lines 30-34). As neither of the references disclose either of the limitations described above, Applicant submits that even if there was motivation to combine the references, which Applicant does no concede that there is, a combination of the references would not result in the present invention as claimed. In particular, as the prior art is directed to controlling the power of respective carriers of a multi-carrier transmitter and the claims of the present application are directed to "setting relative powers of the set of code channels", which are transmitted on a single carrier, Applicant submits that the combination of the references would not result in the present invention as claimed because neither reference discloses the limitation of setting relative powers of respective code channels.

For at least the reasons stated above, it is respectfully submitted that the Examiner has failed to satisfy the requirements necessary for establishing a *prima facie* case of obviousness. The combination of references does not teach all the limitations of the claims and there is no proper motivation to combine the references. It is requested that the Examiner reconsider and withdraw the rejections under 35 U.S.C. 103(a).

Claims 3-13, 17, 19 and 22-24 are objected to as being dependent on rejected base claims, but the Examiner indicates that they would be allowable if rewritten in independent form. It is respectfully submitted that it is not necessary to rewrite these claims in independent form because the rejection of the base claims should be withdrawn.

In view of the foregoing, early favorable consideration of this application is earnestly solicited.

Respectfully submitted,

JIN, XIN ET AL

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Date: June 7, 2007

RAB:MSS:mcg

ANNOTATED SHEET SHOWING CHANGES

1/5

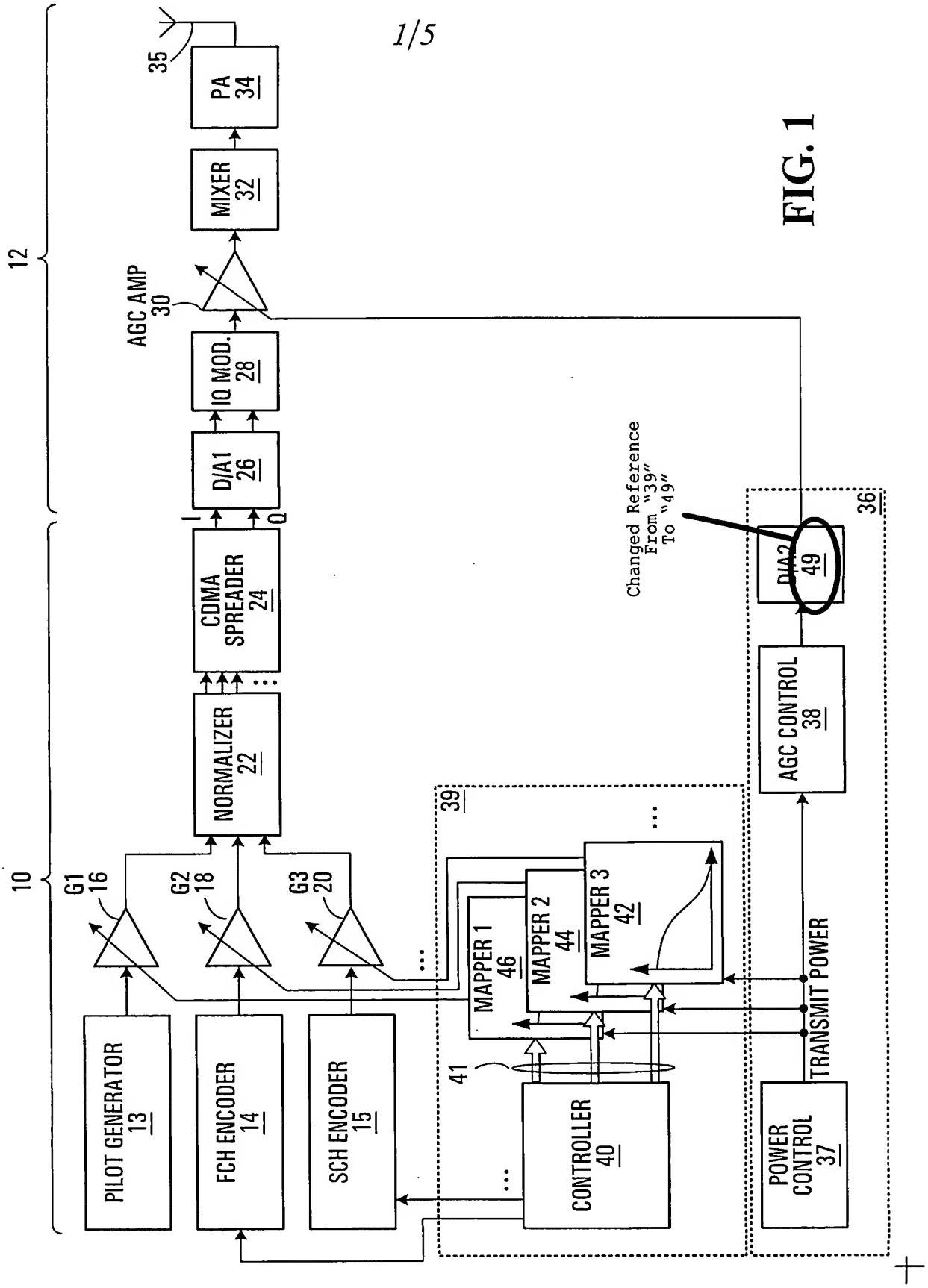

FIG. 1

ANNOTATED SHEET SHOWING CHANGES

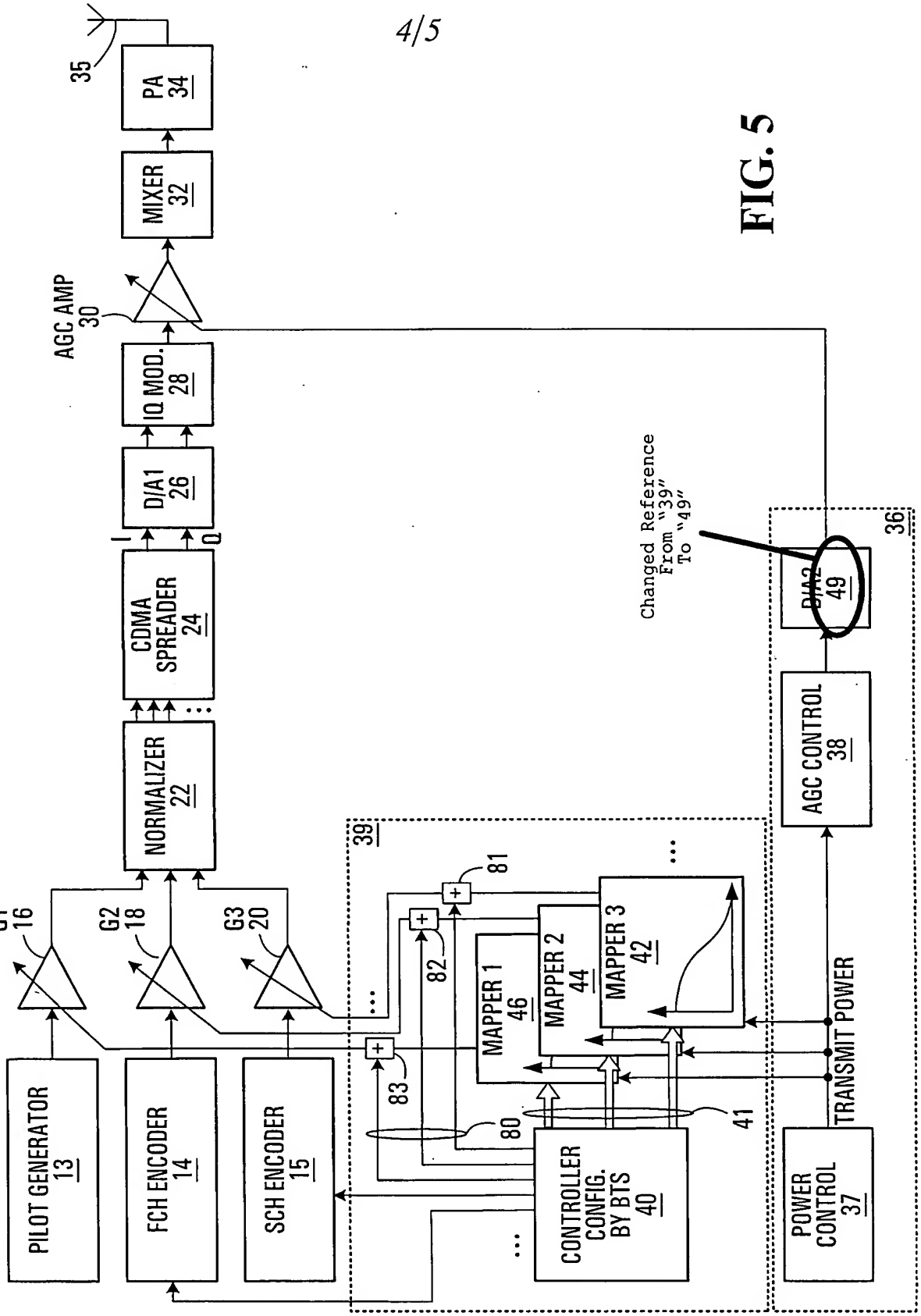

FIG. 5